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CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

REPORT
SUMMER 1998

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Once More Into the Chaco: An Update on Proyecto Taguá

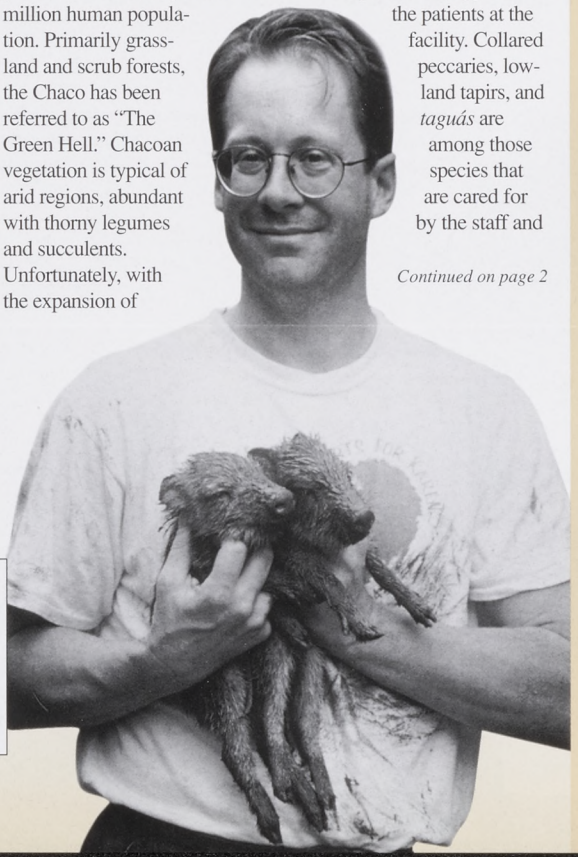
Our previous experience with the weather in the Chaco region of Paraguay taught us that "anything is possible." It is clear that the effects of El Niño are not restricted to the Northern Hemisphere, as heavy rain, muddy roads, and relentless mosquitoes were encountered while working on the *taguá*, or giant peccary, project in the typically hot, dry Chaco. Our research team included Zoological Society of San Diego staff—Dr. Rebecca Papendick, pathologist; Dr. Mark Edwards, nutritionist; and Dr. Jack Allen, veterinarian—along with Dr. Brad Steele, a veterinarian with the University of California, Davis.

In March, we set out for a two-week stay at the site of Proyecto Taguá. This is situated on a parcel of land set aside in 1985 by CRES founding director Dr. Kurt Benirschke, in order to preserve this endangered species. In 1989, Proyecto Taguá came under the direction of the Center for Reproduction of Endangered Species (CRES), and the project is managed on site by Jakob and Maria Unger. Thanks to this project, the Chacoan giant peccary now has a fighting chance for survival.

The Chaco covers over two-thirds of Paraguay, yet this region is home to less than 2 percent of the country's 4.8 million human population. Primarily grassland and scrub forests, the Chaco has been referred to as "The Green Hell." Chacoan vegetation is typical of arid regions, abundant with thorny legumes and succulents. Unfortunately, with the expansion of human populations and the application of inefficient agricultural techniques, sizable areas of undisturbed habitat are rare.

The town of Filadelfia is the center of activity for the region. A sanatorium within the town maintains a small collection of local fauna, in part, as therapy for the patients at the facility. Collared peccaries, lowland tapirs, and *taguás* are among those species that are cared for by the staff and

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Dr. Mark Edwards, Zoological Society nutritionist, holds two newborn taguás. *By 1988, the first captive births occurred at Proyecto Taguá, and since then there have been more than 200 births at the site.*



California Condor Genetics
Finding more ways to save condors.
See page 3.



Perfect Timing
Monitoring giant panda estrus.
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How to Enhance Their Future
Estate planning with a difference.
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Once More Into the Chaco: An Update on Proyecto Taguá

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patients of this facility. The animal collection is an important community resource, and it is often visited by tourists anxious to see animals of the region.

During this visit, our accomplishments included: (a) establishing and cataloging a pathology archive of tissues from 27 individual *taguás* collected since the project's inception; (b) training of project managers in gross pathology techniques and recording this information in the standardized Zoological Society computer records; (c) immobilization, health examination, and permanent identification of 25 *taguás*; (d) scientific identification of plant food items consumed by free-ranging *taguás*; (e) description and identification of nonfood plant items that occur within the native habitat of the *taguá*; and (f) description, measurement, and photo documentation of the *taguá* gastrointestinal tract.





Because of their reproductive success, some taguás *have been released into native habitat. In 1996, the Zoological Society obtained permits to import 10* taguás *to the Phoenix Zoo, which established a second breeding colony for this endangered species.*

The highlight of the trip was the release of 14 captive-bred *taguás* into two separate regions supporting natural Chaco vegetation. The Zoological Society is dedicated to the research and conservation of the Chacoan giant peccary. It is our desire to expand and develop a more comprehensive program to include the study of the diverse plant and animal species in the Chaco, a fragile and vulnerable ecosystem.

—Jack Allen, D.V.M., Senior Veterinarian/ Wild Animal Park, and Mark Edwards, Ph.D., Nutritionist/ Zoo and Wild Animal Park

Proyecto Taguá has been a cooperative effort between the Zoological Society of San Diego, the Paraguayan government, the Foundation for Endangered Species, and the United States Peace Corps.



Here Drs. Brad Steele and Rebecca Papendick perform a physical examination on an anesthetized taguá, *adding data to the general biology of this rare and interesting species.*

Genetics

A few years ago it seemed revolutionary to undertake genetics studies with anything but a sample of blood or other tissue. Scientists could not imagine that an important resource could be found in seemingly worthless samples such as secretions, excretions, and even broken eggshells. The advent of PCR, the polymerase chain reaction for which La Jollan Kerry Mullis won the Nobel Prize in 1993, has allowed all kinds of samples previously unsuitable for genetics studies to become routine sources of DNA for genetic analysis. The pioneering studies of Dr. Karen Garner on the genetics of mountain gorillas was only possible because hair samples left behind in the sleeping nests gorillas make could be the source of genetic information, when used with specially designed tools called DNA primers. Today, hair is considered an excellent source of DNA, and other types of samples represent the avant-garde in genetic samples.



DNA is now being extracted from feces of animals such as giant pandas, bighorn sheep, and black rhinos for genetic analysis in support of conservation efforts of wild populations. Recently, scent marks from giant pandas have also proved feasible sources of DNA for genetic analysis. One of the latest applications of this new genetic technology for assisting with the recovery of endangered species is our latest method for identifying the sex of California condor chicks. To the human eye, individual adult California condors of the two sexes look the same, and this includes the chicks. Special methods have to be developed to determine at an early age which condors are male and which are female. Utilizing specially designed primers, California condor chicks can have their sex determined from minute pieces of membrane left in the eggshell after hatching. This method requires no handling of the birds and is faster and less expensive than previous methods, which required blood samples. We find ourselves constantly challenged to think of new ways to collect information that is important for conservation efforts.





Save the Date for Celebration for the Critters!

Party primates can swing and sway in the moonlight as the San Diego Zoo presents the 18th annual Celebration for the Critters on Saturday, September 26, from 7 P.M. until midnight. This popular party with this year's theme, **Dancin' and Prancin' Beneath the CREScent Moon**, benefits the worldwide conservation efforts of the Zoological Society's Center for Reproduction of Endangered Species (CRES). Last year's Celebration netted an unprecedented $185,000, and the 1998 festive fund-raiser is expected to top that. Dancin' and prancin' to the rock-and-roll rhythms of Haute Chile and other musical entertainment will work up a beastly appetite. No need to roar! Exotic taste treats from more than 100 restaurants and beverage vendors will abound. This wild affair also features a spectacular Silent Auction, prize drawings, zany games, animal visitors, rides under the stars on the Skyfari, and much more.

Tickets are on sale for $50 per person ($60 after September 11) and Zoo membership is not required. Dash like a cheetah and call (619)231-1515, extension 4236, for ticket and VIP information today! Ticket sales will be limited.

Grants

The Center for Reproduction of Endangered Species is grateful to the following for their support of imperiled wildlife:

The Amerman Family Foundation has made a generous gift grant to fund a behavioral study of endangered douc langurs. The Society is responsible for managing the current North American population of 14 of the primates, housed at three locations. The foundation is also funding a two-year conservation project for critically endangered drill baboons, and it has made a contribution for the purchase of equipment for the California Condor Recovery Program. **The Plum Foundation** gave a grant in support of Dr. Oliver Ryder's genetics work in black rhino conservation. An **anonymous foundation** has given a grant toward the CRES endowment.

Perfect Timing: Bai Yun's Spring Estrus

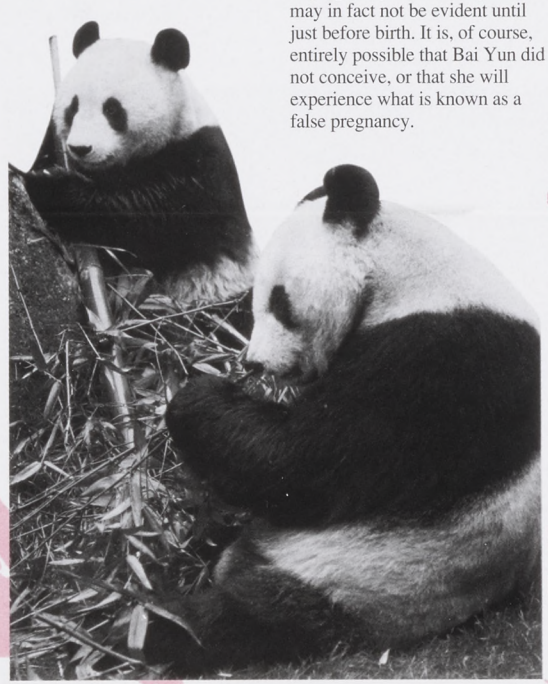
During the last week of March, we noticed indicators that our female giant panda, Bai Yun, was entering her spring estrus. Within two to three days of a dramatic rise in her rate of scent marking from 1 or 2 per hour to nearly 25 per hour, our endocrine laboratory reported her estrogen levels were also beginning the ascent that typically leads to a peak near the time of ovulation. By the first day of April, the vaginal cells were changing in both color and structure, confirming that estrus was under way. Pooling our various lines of information at a midday meeting on April 8, we concluded that Bai Yun would very likely ovulate within the next 24 hours.

Male Shi Shi, meanwhile, was being given daily opportunities to express a sexual interest in Bai Yun. Although his health and activity levels were noticeably improved over the mating season of 1997, Shi Shi failed to show a single instance of friendly responsiveness to Bai Yun's sexual overtures right up to the morning of April 8. It was for this reason that we decided to prepare both animals for the procedure needed to inseminate her artificially.

Our readers may recall that in 1997, intervention with artificial insemination was considered but not attempted. This decision was based on the priority assigned to the scientific study of the pandas: we needed to follow an episode of estrus to its conclusion in order to obtain normative values on hormonal, cytological, and behavioral parameters, as well as their interaction. These values provided a baseline that could be used to search for any changes that might be evident in the two animals during the 1998 mating season. In retrospect, this proved to be a good decision, for it inspired confidence about the timing of an artificial insemination procedure, which was attempted this year.

Pooling our various lines of information at a midday meeting on April 8, we concluded that Bai Yun would very likely ovulate within the next 24 hours.

For artificial insemination to have a good chance of succeeding, there are three major requirements: a good quality semen sample; precise placement of the semen within the female's reproductive tract; and availability of semen for fertilization at the moment ovulation occurs. In all three of these, our efforts came as close to being perfect as one could wish. On all of the usual parameters, the semen sample ranked at or near the highest values normally obtained under these conditions, with high sperm concentration and motility and low percentage of dead sperm. Although the endocrine profile from Bai Yun's latest urine sample had shown only a modest decline from its peak value at the time we decided to inseminate, subsequent samples revealed that the timing was perfect. Because of the quantity of semen obtained from a single collection episode, enough was available to undertake a second insemination procedure on April 9, thereby extending by 24 hours the window of opportunity for fertilization to occur.



Despite the fact that this procedure went so smoothly, we must caution against assuming that a pregnancy will result. Our readers should realize that, because implantation of the blastocyst (future embryo) into the uterine wall of the female is delayed by an unknown period, confirmation of pregnancy is also delayed and may in fact not be evident until just before birth. It is, of course, entirely possible that Bai Yun did not conceive, or that she will experience what is known as a false pregnancy.

It may appear that, with so much focus on estrus and intervention with artificial insemination, reproduction is the primary objective of our program. However, it remains the case that permission to import our giant pandas was for study of their communication system, despite the fact that Shi Shi is a male of advanced age that is unrepresented in the captive gene pool, and despite the fact that through inaction another year of Bai Yun's reproductive life would be lost. We are confident that the patterns of scent marking, vocalizing, and solicitation shown by the female—and their nice fit with the hormonal data, seen in both seasons—constitute what everyone would agree was an estrous episode.

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However, we are left with questions on the functional significance of these activities, since the confirmatory responses from the male were not seen. The best proof of fertility and of an understanding of the events leading to the moment when fertilization may take place is pregnancy, whether naturally or artificially initiated. Thus, while artificial insemination leading to pregnancy could produce an offspring, such an outcome would also advance our knowledge of the reproductive biology of the giant panda.

—Donald G. Lindburg, Ph.D., Head of Behavior Division/CRES

Cans for Critters Collects at Earth Day

Cans for Critters participation at Earth Day in Balboa Park, April 19, was a great success with the help of Z 90, Radio Latina, X 99, and Tomra Pacific, Inc. (formerly Reynold's Recycling).

Over 50,000 people attended Earth Day festivities in Balboa Park, which were organized by EarthWorks, a nonprofit corporation dedicated to a clean, healthy, and prosperous California. Zoo staff handed out prizes for recycled cans redeemed at the Cans for Critters booth. Sydney Koala and Matilda Koala danced to the music and greeted all recyclers who were there helping to make the Earth a better place to live.

Not only was Cans for Critters a big hit at Earth Day, but on April 22 at the Very Important Planet Reception, the Cans for Critters program won the Youth Stewardship Award. The award is given by EarthWorks and the City of San Diego Environmental Services Department. In the past 18 years, the Cans for Critters program has raised more than $260,000 to benefit the Center for Reproduction of Endangered Species, proving that we can all think globally while acting locally!

For further information on how to get connected to the Cans for Critters program for yourself, school, or work, call Kathleen Rafaat in the development office at (619) 557-3995.



Enhance Their Future and Yours

You can combine your philanthropic desires with an increase in your personal income by contributing appreciated securities to the Zoological Society of San Diego's Life Income Fund. How does it work? It's simple. Just transfer the securities or mutual fund units into the Life Income Fund. Your transfer is not subject to capital gains taxation, and you will be eligible for a charitable gift income tax deduction on the present value of the securities—not just your basis! They will be sold by the Trustee free of tax and reinvested in an investment-grade corporate bond fund. You will be assigned units in the Fund and you (and your spouse or other designee) will receive lifetime variable income payments therefrom quarterly.

Two important things to keep in mind: your contribution will be irrevocable, and both you and your spouse or other designated income beneficiary must be at least fifty years of age to participate. Your contribution may immediately qualify you for major donor Circle status as well. Your income interest terminates upon the death of the last income beneficiary, at which time your units will be transferred to the Zoological Society of San Diego to support the vital conservation and education programs that are dependent upon the financial support of friends like yourself.

If you would like to learn more about this subject, please phone Patrick O'Reiley, Estate Gifts Director, at (619) 685-3215 for a free informational brochure.



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Today more than ever, people are taking great interest in natural resources and conservation. But with busy schedules and active life-styles, it can be difficult to commit the time necessary to get involved in a worthwhile cause. Luckily, through CRES licensed products, people can contribute to the research efforts at CRES by purchasing merchandise carrying the CRES logo.

For almost 10 years, our trademarks—including CRES and the San Diego Zoo—have been licensed on quality products such as beautiful plush toy animals and puppets, attractive notecards and stationery, music CDs, calendars, children's apparel, and more.

Manufacturers benefit when their products receive the recognition associated with our name. Consumers feel good when purchasing products that support the important work carried out by CRES. And CRES receives greater recognition, which is generated by its licensing program. It's a winning combination for retailers, consumers, and CRES!



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